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| S:\Communications\Logos and photos\SDBORLogos\final_sdbor_webreadyBW_trans.gif | **SOUTH DAKOTA BOARD OF REGENTS**  ACADEMIC AFFAIRS FORMS |
| Substantive Program Modification Program |
|  |  |

Use this form to request minor changes in existing programs (majors, minors, certificates, or specializations).

|  |  |
| --- | --- |
| **UNIVERSITY:** | DSU |
| **CURRENT PROGRAM TITLE:** | Mathematics Education & Mathematics for Information Systems |
| **CIP CODE:** | 27.0101 |
| **UNIVERSITY DEPARTMENT:** | DMATH |
| **UNIVERSITY DIVISION:** | College of Arts and Sciences |

**University Approval**

*To the Board of Regents and the Executive Director: I certify that I have read this proposal, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.*

|  |  |  |
| --- | --- | --- |
| C:\Users\slaughts\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Dr. McKay Signature.jpg |  | 3/23/2018 |
| Vice President for Academic Affairs or  President of the University |  | Date |

|  |
| --- |
|  |

1. **This modification addresses a change in (*place an “X” in the appropriate box*):**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Total credits required within the discipline |  | Total credits of supportive course work |
|  |  |  |  |
|  | Total credits of elective course work |  | Total credits required for program |
|  |  |  |  |
|  | Program name |  | Existing specialization |
|  |  |  |  |
|  | CIP Code |  | Other (explain below) |

**Other:** In this Substantive Program Modification form, DSU is proposing collapsing two majors, 1) Math Education and 2) Math for Information Systems into one major (Mathematics) with four specializations: 1) Cryptography; 2) Intermediate Education; 3) Secondary Education; and 4) Information Systems. Further explanation is provided in question 7.

1. **Effective date of change:** Fall 2018
2. **Program Degree Level (*place an “X” in the appropriate box*):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Associate |  | Bachelor’s |  | Master’s |  | Doctoral |  |

1. **Category (*place an “X” in the appropriate box*):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Certificate |  | Specialization |  | Minor |  | Major |  |

1. **If a name change is proposed, the change will occur (*place an “X” in the appropriate box*):**

|  |  |
| --- | --- |
|  | On the effective date for all students |

|  |  |
| --- | --- |
|  | On the effective date for students new to the program (enrolled students will graduate from existing program) |
|  |

|  |  |
| --- | --- |
| **Proposed new name:** | **Mathematics** |
|  | *Reminder: Name changes may require updating related articulation agreements, site approvals, etc.* |

1. **Primary Aspects of the Modification (*add lines or adjust cell size as needed*):**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Existing Curriculum* | | | | *Proposed Curriculum (highlight changes)* | | | | | |
| **Pref.** | **Num.** | **Title** | **Cr.**  **Hrs.** |  | **Pref.** | **Num.** | **Title** | **Cr. Hrs.** | |
| **System Wide General Education Requirement** | | | **30** |  | **System Wide General Education Requirement**  (All students are required to take MATH 123 as part of the general education requirements) | | | **30** | |
|  | | |  |  |  | | | | |
| **Mathematics Core Requirements** | | | **12** |  | **Mathematics Core Requirements** | | | **12** | |
| MATH | 201 | Introduction to Discrete Math | 3 |  | MATH | 201 | Introduction to Discrete Math | 3 | |
| MATH | 281 | Introduction to Statistics | 3 |  | MATH | 281 | Introduction to Statistics | 3 | |
| MATH | 315 | Linear Algebra | 3 |  | MATH | 315 | Linear Algebra | 3 | |
| MATH | 316 | Discrete Mathematics | 3 |  | MATH | 316 | Discrete Mathematics | 3 | |
|  | | |  |  |  | | |  | |
| **Information Systems Specialization** | | |  |  | **Information Systems Specialization** | | |  | |
| **Mathematics Component** | | | **16** |  | **Mathematics Component** | | | **16** | |
| MATH | 125 | Calculus II | 4 |  | MATH | 125 | Calculus II | 4 | |
| Choose 12 credits from the following | | | 12 |  | Choose 12 credits from the following | | | 12 | |
| MATH | 225 | Calculus III | 4 |  | MATH | 225 | Calculus III | 4 | |
| MATH | 282 | Mathematics of Games | 3 |  | MATH | 282 | Mathematics of Games | 3 | |
| MATH | 318 | Adv. Discrete Mathematics | 3 |  | MATH | 318 | Adv. Discrete Mathematics | 3 | |
| MATH | 321 | Differential Equations | 3-4 |  | MATH | 321 | Differential Equations | 3-4 | |
| MATH | 361 | Modern Geometry | 3 |  | MATH | 361 | Modern Geometry | 3 | |
| MATH | 381 | Intro to Probability and Stats | 3-4 |  | MATH | 381 | Intro to Probability and Stats | 3-4 | |
| MATH | 413 | Abstract Algebra I | 3 |  | MATH | 413 | Abstract Algebra I | 3 | |
| MATH | 418 | Mathematical Modeling | 3 |  | MATH | 418 | Mathematical Modeling | 3 | |
|  |  |  |  |  | MATH | 436 | Number Theory and Cryptography | 3 | |
|  |  |  |  |  | MATH | 437 | Cryptography and Codes | 3 | |
| MATH | 471 | Numerical Analysis I | 3 |  | MATH | 471 | Numerical Analysis I | 3 | |
| MATH | 475 | Operations Research | 3 |  | MATH | 475 | Operations Research | 3 | |
| MATH | 492 | Topics | 1-6\* |  | MATH | 492 | Topics | 1-6\* | |
| MATH | 498 | Undergrad Research/Scholarship | 1-6 |  | MATH | 498 | Undergrad Research/Scholarship | 1-6 | |
| \*May be repeated provided student does not enroll in the same topics course. | | | |  | \*May be repeated provided student does not enroll in the same topics course. | | | | |
| **Computer Information Systems Minor** | | | **24** |  | **Computer Information Systems Minor** | | | **24** | |
| **Minor (Biology, Business Administration, Chemistry, Computer Forensics, Cyber Operations, Computer Science, Physics)** | | | **18-21** |  | **Minor (Biology, Business Administration, Chemistry, Computer Forensics, Cyber Operations, Computer Science, Physics)**  (Non-teaching majors must choose one of the above minors) | | | **18-21** | |
|  | **Electives** | | **17-20** |  |  | **Electives** | | **17-20** | |
| Students obtaining a degree in Computer Science, Computer Game Design, Physical Science, Biology, or Biology Education only need to complete the Mathematics component of the program to obtain a second major in Mathematics with a specialization in Computational Sciences. | | | |  | Students obtaining a degree in Computer Science, Computer Game Design, Cyber Operations, Physical Science, or Biology need only complete the Mathematics Core (12 cr.) and the Mathematics Component (16 cr.) with a specialization in Information Systems to earn this as a second major. | | | | |
|  |  |  |  |  | **Cryptography Specialization** | | |  | |
|  |  |  |  |  | **Mathematics Component** | | | **25** | |
|  |  |  |  |  | MATH | 125 | Calculus II | 4 | |
|  |  |  |  |  | MATH | 381 | Intro to Probability and Stats | 3-4 | |
|  |  |  |  |  | MATH | 413 | Abstract Algebra I | 3 | |
|  |  |  |  |  | MATH | 436 | Number Theory and Cryptography | 3 | |
|  |  |  |  |  | MATH | 437 | Cryptography and Codes | 3 | |
|  |  |  |  |  | Choose 9 credits from the following | | | 6 | |
|  |  |  |  |  | MATH | 225 | Calculus III | 4 | |
|  |  |  |  |  | MATH | 282 | Mathematics of Games | 3 | |
|  |  |  |  |  | MATH | 318 | Adv. Discrete Mathematics | 3 | |
|  |  |  |  |  | MATH | 321 | Differential Equations | 3-4 | |
|  |  |  |  |  | MATH | 361 | Modern Geometry | 3 | |
|  |  |  |  |  | MATH | 471 | Numerical Analysis I | 3 | |
|  |  |  |  |  | MATH | 475 | Operations Research | 3 | |
|  |  |  |  |  | MATH | 492 | Topics | 1-6\* | |
|  |  |  |  |  | MATH | 498 | Undergrad Research/Scholarship | 1-6 | |
|  |  |  |  |  | \*May be repeated provided student does not enroll in the same topics course. | | | | |
|  |  |  |  |  | **Computer Science Minor** | | | **18** | |
|  |  |  |  |  | **Cyber Operations Minor** | | | **18** | |
|  |  |  |  |  | **Electives** | | | **20** | |
|  |  |  |  |  | Students obtaining a degree in Computer Science or Cyber Operations need only complete the Mathematics Core (12 cr.) and the Mathematics Component of the Cryptography Specialization (25 cr.) to earn math as a second major. | | | | |
| **Secondary Education Specialization** | | | |  | **Secondary Education Specialization**  (Student must take EPSY 210 & INED 211  as part of the general education requirements) | | |  | |
| **Mathematics** **Component** | | | **23** |  | **Mathematics Component** | | | **23** | |
| MATH | 125 | Calculus II | 4 |  | MATH | 125 | Calculus II | 4 | |
| MATH | 341 | Math Concepts for Teachers I | 3 |  | MATH | 341 | Math Concepts for Teachers I | 3 | |
| MATH | 342 | Math Concepts for Teachers II | 3 |  | MATH | 342 | Math Concepts for Teachers II | 3 | |
| MATH | 361 | Modern Geometry | 3 |  | MATH | 361 | Modern Geometry | 3 | |
| MATH | 413 | Abstract Algebra | 3 |  | MATH | 413 | Abstract Algebra | 3 | |
| MATH | 488 | Capstone | 1 |  | MATH | 488 | Capstone | 1 | |
| Choose 6 credits from the following | | | 6 |  | Choose 6 credits from the following | | | 6 | |
| MATH | 225 | Calculus III | 4 |  | MATH | 225 | Calculus III | 4 | |
| MATH | 282 | Mathematics of Games | 3 |  | MATH | 282 | Mathematics of Games | 3 | |
| MATH | 318 | Adv. Discrete Mathematics | 3 |  | MATH | 318 | Adv. Discrete Mathematics | 3 | |
| MATH | 321 | Differential Equations | 3-4 |  | MATH | 321 | Differential Equations | 3-4 | |
| MATH | 381 | Intro to Probability and Stats | 3-4 |  | MATH | 381 | Intro to Probability and Stats | 3-4 | |
| MATH | 418 | Mathematical Modeling | 3 |  | MATH | 418 | Mathematical Modeling | 3 | |
|  |  |  |  |  | MATH | 436 | Number Theory and Cryptography | 3 | |
|  |  |  |  |  | MATH | 437 | Cryptography and Codes | 3 | |
| MATH | 471 | Numerical Analysis I | 3 |  | MATH | 471 | Numerical Analysis I | 3 | |
| MATH | 475 | Operations Research | 3 |  | MATH | 475 | Operations Research | 3 | |
| MATH | 492 | Topics | 1-6\* |  | MATH | 492 | Topics | 1-6\* | |
| MATH | 498 | Undergrad Research/Scholarship | 1-6 |  | MATH | 498 | Undergrad Research/Scholarship | 1-6 | |
| \*May be repeated provided student does not enroll in the same topics course. | | | |  | \*May be repeated provided student does not enroll in the same topics course. | | | | |
| **K-12 Educational Technology Minor** | | | **18-19** |  |  | **K-12 Educational Technology Minor** | | **18-19** | |
| CSC | 105 | Introduction to Computers | 3 |  | CSC | 105 | Introduction to Computers | 3 | |
| CIS | 350 | Computer Hardware, Data Communications and Networking | 3 |  | CIS | 350 | Computer Hardware, Data Communications and Networking | 3 | |
| EDFN | 365 | Computer-Based Technology & Learning | 3 |  | EDFN | 365 | Computer-Based Technology & Learning | 3 | |
| SEED | 401 | Methods of Educational Tech | 1 |  | SEED | 401 | Methods of Educational Technology | 1 | |
| Choose one course from the following | | |  |  | Choose one course from the following | | |  | |
| CIS | 123 | Problem Solving and Programming | 3 |  | CIS | 123 | Problem Solving and Programming | 3 | |
| CIS | 130 | Visual Basic Programming |  | CIS | 130 | Visual Basic Programming |
| CSC | 150 | Computer Science I |  | CSC | 150 | Computer Science I |
| Choose three courses from the following | | | 3 |  | Choose three courses from the following | | | 3 | |
| CIS | 206 | Advanced Applications: |  | CIS | 206 | Advanced Applications: |
| CIS | 207 | Advanced Applications: Spreadsheet |  | CIS | 207 | Advanced Applications: Spreadsheet |
| CIS | 208 | Advanced Applications: Database |  | CIS | 208 | Advanced Applications: Database |
| CIS | 209 | Advanced Applications: SAS |  | CIS | 209 | Advanced Applications: SAS |
| CIS | 210 | Quickbooks |  | CIS | 210 | Quickbooks |
| Choose one course from the following | | | 2-3 |  | Choose one course from the following | | | 2-3 | |
| SEED | 301 | Technology for Math Teachers |  | SEED | 301 | Technology for Math Teachers |
| EDER | 415 | Educational Assessment |  | EDER | 415 | Educational Assessment |
| ELED | 422 | K-8 Science and Math Technology |  | ELED | 422 | K-8 Science and Math Technology |
|  |  |  |  |  |  |  |  |  | |
| **Education Component** | | | **27** |  | **Education Component** | | | **27** | |
| SPED | 100 | Introduction to Persons with Exceptionalities | 3 |  | SPED | 100 | Introduction to Persons with Exceptionalities | 3 | |
| EDFN | 338 | Foundations of American Ed | 2 |  | EDFN | 338 | Foundations of American Ed | 2 | |
| EDFN | 475 | Human Relations | 3 |  | EDFN | 475 | Human Relations | 3 | |
| EPSY | 302 | Educational Psychology | 3 |  | EPSY | 302 | Educational Psychology | 3 | |
| SEED | 295 | Practicum | 1 |  | SEED | 295 | Practicum | 1 | |
| SEED | 302 | Secondary/Middle/Content Area Major | 2 |  | SEED | 302 | Secondary/Middle/Content Area Major | 2 | |
| SEED | 440 | Classroom Management | 2 |  | SEED | 440 | Classroom Management | 2 | |
| SEED | 450 | Reading and content Literacy | 3 |  | SEED | 450 | Reading and content Literacy | 3 | |
| SEED | 488 | 7-12 Student Teaching | 8 |  | SEED | 488 | 7-12 Student Teaching | 8 | |
| **Electives** | | | **9-10** |  | **Electives** | | | **9-10** | |
|  |  |  |  |  | **Intermediate Education Specialization**  (Student must take EPSY 210 & INED 211 as part of the general education requirements) | | |  | |
|  |  |  |  |  | **Mathematics Component** | | | **16** | |
|  |  |  |  |  | SEED | 301 | Technology for Math Teachers | 3 | |
|  |  |  |  |  | MATH | 341 | MATH Concepts for Teachers I | 3 | |
|  |  |  |  |  | MATH | 342 | Math Concepts for Teachers II | 3 | |
|  |  |  |  |  | MATH | 361 | Modern Geometry | 3 | |
|  |  |  |  |  | ELED | 422 | K-8 Science and Math Technology | 3 | |
|  |  |  |  |  | MATH | 488 | Capstone | 1 | |
|  |  |  |  |  |  |  |  |  | |
|  |  |  |  |  | **K-12 Educational Technology Minor** | | | **18** | |
|  |  |  |  |  | CSC | 105 | Introduction to Computers | 3 | |
|  |  |  |  |  | EDER | 415 | Educational Assessment | 2 | |
|  |  |  |  |  | CIS | 350 | Computer Hardware, Data Communications and Networking | 3 | |
|  |  |  |  |  | EDFN | 365 | Computer-Based Technology & Learning | 3 | |
|  |  |  |  |  | SEED | 401 | Methods of Educational Technology | 1 | |
|  |  |  |  |  | **Choose one of the following courses** | | | 3 | |
|  |  |  |  |  | CIS | 123 | Problem Solving and Programming |  | |
|  |  |  |  |  | CIS | 130 | Visual Basic Programming |  | |
|  |  |  |  |  | CSC | 150 | Computer Science 1 |  | |
|  |  |  |  |  | **Choose three of the following courses** | | | 3 | |
|  |  |  |  |  | CIS | 206 | Advanced Applications |  | |
|  |  |  |  |  | CIS | 207 | Advanced Applications Spreadsheet |  | |
|  |  |  |  |  | CIS | 208 | Advanced Applications: Database |  | |
|  |  |  |  |  | CIS | 209 | Advanced Applications: SAS |  |
|  |  |  |  |  | CIS | 210 | QuickBooks |  | |
|  |  |  |  |  |  |  |  |  | |
|  |  |  |  |  | **Education Component** | | | **28** | |
|  |  |  |  |  | SPED | 100 | Introduction to Persons with Exceptionalities | 3 | |
|  |  |  |  |  | EDFN | 338 | Foundations of American Ed | 2 | |
|  |  |  |  |  | EDFN | 475 | Human Relations | 3 | |
|  |  |  |  |  | EPSY | 300 | Survey of Middle Level Education | 1 | |
|  |  |  |  |  | EPSY | 302 | Educational Psychology | 3 | |
|  |  |  |  |  | SEED | 295 | Practicum | 1 | |
|  |  |  |  |  | SEED | 302 | Secondary/Middle/Content Area Major | 2 | |
|  |  |  |  |  | SEED | 440 | Classroom Management | 2 | |
|  |  |  |  |  | SEED | 450 | Reading and content Literacy | 3 | |
|  |  |  |  |  | SEED | 488 | 7-12 Student Teaching | 8 | |
|  |  |  |  |  |  |  |  |  | |
|  |  |  |  |  |  |  | **Electives** | **16** | |

1. **Explanation of the Change:**

The current Mathematics for Information Systems and Mathematics Education programs are both programs that constitute a major in mathematics, a computer related minor and the equivalent of a second minor. Therefore we propose merging the programs under the Mathematics title and distinguish them through specializations. The purpose of the additional specialization in Intermediate Education is to retain students wanting to teach mathematics but at another level. Currently the only viable option to teach high school mathematics besides getting a secondary math degree, is to become certified as a teacher in the state (major in a non-math related degree program), then take the middle school Praxis exam to earn the Intermediate Math Education endorsement to complement their initial certification. This alternative program will also enable the department of education to bolster the requirements to earn an intermediate math endorsement in the future if they so choose. The goal of the additional specialization in Cryptography is to increase the number of students majoring in Computer Science to earn a double major in Mathematics.